



MTR2000™
Base Station, Repeater
and Receiver
For Analog Conventional,
and Trunking Systems
335 - 405 MHz

Instruction / Field Service Manual

68P81099E80-D

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In order to obtain performance of this warranty, purchaser must contact its Motorola salesperson or Motorola at the address first above shown, attention Quality Assurance Department.

FCC INTERFERENCE WARNING

The FCC requires that manuals pertaining to Class A and Class B computing devices must contain warnings about possible interference with local residential radio and TV reception. This warning reads as follows:

NOTE: The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial or residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with its instruction manual, may cause harmful interference to radio communication.

ELECTROMAGNETIC COMPATIBILITY

This product conforms with the protection requirements of Council Directive 89/336/EEC of 3rd May 1989 (EMC) on the approximation of the laws of the Member States relating to electromagnetic compatibility.

ENVIRONMENTAL INFORMATION

Material Content

The material content of the MTR2000 is 16% of the product it replaces.

The following table provides a rough estimate of the material content of the station. The actual percentages vary in relation to the station configuration. The power supply is not included in the percentage of weights since the end-of-life value is dependent on the model of supply used in the station.

Most of the Material categories are self explanatory. Copper bearing materials:

- include any material that contains copper.
- primarily consist of circuit boards.
- exclude cables (separate Material category).

Material	% by weight
Aluminum	92%
Steel	2%
Copper Bearing	4%
Cable	1%
Polycarbonate	1%

Beryllium Oxide has been used in the power amplifier. Beryllium Oxide should not be subjected to any process which will generate dust.

Features

Over 92% of the station is made of aluminum, one of the most recycled materials commonly available today. In addition, the aluminum used in the station consists of 90-95% recycled content.

Plastic use has been minimized since the market for recycled engineering plastics is limited. The plastic which has been used for the front panel is a relatively clean and pure resin.

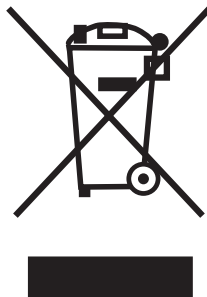
Disposal of your Electronic and Electric Equipment

Please do not dispose of Electronic and Electric Equipment or Electronic and Electric Accessories with your household waste. In some countries or regions, collection systems have been set up to handle waste of electrical and electronic equipment.

In European Union countries, please contact your local equipment supplier representative or service center for information about the waste collection system in your country.

Disposal Guideline

The following symbol on a Motorola product indicates that the product should not be disposed of with household waste.






MTR2000™
**Base Station, Repeater
and Receiver**
**For Analog Conventional,
and Trunking Systems**
335 - 405 MHz

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STATION MODULES

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RECEIVER MODULE, 335 to 405 MHz

Model CLD1020 **68P81095E24**

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TRANSMITTER CIRCUITRY

EXCITER MODULE

Model CLD1030 **68P81095E26**

 Description 1

 Input and Output Connections 2

 Functional Theory of Operation. 3

40 W POWER AMPLIFIER MODULE

Model CLD1010 **68P81095E27**

 Description 1

 Identification of Inputs/Outputs 2

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STATION CONTROL CIRCUITRY

STATION CONTROL MODULE

Model CLN1465 **68P81096E32**

 Description 1

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4 WIRE, WIRELINE INTERFACE BOARD**Model CLN1203****68P81096E29**

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TRANSMITTER CIRCUITRY

EXCITER MODULE
Model CLD1030 68P81095E26

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40 W POWER AMPLIFIER MODULE
Model CLD1010 68P81095E27

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STATION CONTROL MODULE

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AUXILIARY I/O CIRCUITRY

AUXILIARY I/O BOARD

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AUXILIARY I/O BOARD

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BACKPLANE INTERCONNECT BOARD

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250 W POWER SUPPLY, AC with DC Backup Connector

Model CLN1221 **68P81096E34**

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250 W POWER SUPPLY, AC with DC Backup Connector

Model DLN6624 **68P81011Y29**

Table 1.	DLN6624 Power Supply Module Performance Specifications	2
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250 W POWER SUPPLY, DC-Only

Model CLN1223 **68P81096E52**

Table 1.	CLN1223 DC-Only Power Supply Module Performance Specifications	2
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MODEL AND OPTION SELECTION PROCEDURE (INCLUDES MODEL/OPTION COMPLEMENTS)

The following equipment ordering process is used by the sales representative to equip a 350 MHz station with the proper hardware and firmware for specific system types and customer-defined options and features. This process is described here, showing the structure and contents of the various models and options.

1

The Factory ID Model numbers are:

MTR2000...	Factory ID Model No.	Station Description
Base Stations or Repeaters	T5544, T5766	MTR2000 Station
Receivers	T5731, T5769	MTR2000 Receiver



Option numbers are used to determine the configuration of an MTR2000 station. The suffixes of these option numbers (i.e., the last 2 characters) may change.

The sales model includes the following items which are **common to all stations**:

- Station Control Module.
- Backplane Interconnect Board.
- Backplane hardware.
- Station chassis hardware.
- Front panel.
- Cables.

For Receivers, the sales model determines that the:

- 250W Power Supply module is included in the station, Option X30AM.

If the station is a **Base Station or a Repeater**, the power/frequency option is now selected. The following table shows the available power/frequency option:

	Output Power
Frequency Range	40 W
335 to 405 MHz	Option X983AA

For Base Stations and Repeaters, the power/frequency option determines which:

- Power Supply module; Option X30AM for the 250 W power supply.
- Power Amplifier module (based on frequency band and power level) is included in the station.
- Exciter module (based on frequency band) is included in the station; Option X851AB.
- Receiver module (based on frequency band) is included in the station; Option X854AE.

OR

If the station is a **Receiver**, the frequency option is now selected. The frequency option is determined based on the frequency specified by the customer. The available frequency options are:

Frequency Range	Receiver Option
335 to 405 MHz	Option X943AB

The frequency option determines which:

- Receiver module (based on frequency band) is included in the station; Option X854AE.

2

A System Software Option must be selected **for Base Stations, Repeaters and Receivers** as follows:

System Type	Software Option
Conventional Analog Operation	X597AF
Conventional Analog Receiver	X597AG
Smartnet Analog Trunking Operation	X997AE
Smartnet Analog Trunking Receiver	X997AF
Smartzone Analog Trunking Operation	X51AA
Smartzone Analog Trunking Receiver	X51AB

If the station is a Receiver, go to step 5.

For Trunking Analog Operation the software option determines that the Auxiliary I.O Board is included in the station; Option X151AH.

3

A Station Operation Option must be selected as follows:

Operation Type	Operation Option
Repeater Operation	X580AC
Base Station Operation	X622AC



Station operation option not needed when ordering trunking option X997 or X51.

4

The following lists available options that may be selected in addition to the standard model and options (described in steps 1 through 4).

AVAILABLE HARDWARE OPTIONS FOR 350MHz STATIONS

Option Category	Option and Complement	
DC-Only Power Supplies	X121AC	500 W DC-Only power supply.
	CPN6059A	When this option is ordered, it automatically replaces Option X30AL.
	CPN6060A	500 W DC Power Supply
		DC Power Input Cable
	X121AB	250 W DC-Only power supply.
	CPN6058A	When this option is ordered, it automatically replaces Option X30AM.
Wireline Interface Board (WIB)	CPN6060A	250 W DC Power Supply
		DC Power Input Cable
	X216AC	Add 4-Wire Euro Wireline Interface Board (WIB)
	TTN5066A	4-Wire Euro Wireline Interface Board
	X264AA	Add 4-Wire Wireline Interface Board (WIB)
		This WIB is the factory default, unless X216AC is ordered.
Auxiliary I/O Board	TTN5067A	4-Wire Wireline Interface Board
	X144AC	Add 8-Wire Wireline Interface Board (WIB)
	TTN5068A	8-Wire Euro Wireline Interface Board
	X151AH	Add Auxiliary I/O Board (required for Wildcard operation)
	CLN6698A	Auxiliary I/O Board
External Reference	X747AB	Add External Reference
	CKN6682A	External Reference Cable

AVAILABLE HARDWARE OPTIONS FOR 350MHz STATIONS

Option Category	Option and Complement	
Mounting Racks	X741AF	76.2 cm (30 in) Modular Rack
	THN6752A	Modular Rack, 16-Rack Unit
	CLN6679A	Rack Mounting Hardware
	X742AF	1.143 m (45 in) Modular Rack
	THN6753A	Modular Rack, 24-Rack Unit
	CLN6679A	Rack Mounting Hardware
Slide Rail (for rackmounted station)	X743AF	1.32 m (52 in) Modular Rack
	THN6754A	Modular Rack, 27-Rack Unit
	CLN6679A	Rack Mounting Hardware
	X968AA	Slides, Motorola Cabinet
	THN6788A	Slide rails for mounting station
	X346AB	Slides, Non-Motorola Cabinet
Indoor Cabinets	CLN6833A	Universal slide rails for mounting station
	X52AF	76.2 cm (30 in) Indoor Cabinet
	THN6701A	30" Indoor Cabinet, 2 Rails
	TTN5040A	Grommet Channel Kit
	X308AD	1.168 m (46 in) Indoor Cabinet
	THN6702A	46" Indoor Cabinet, 2 Rails
Trunking Cables	TTN5040A	Grommet Channel Kit
	X180AC	1.524 m (60 in) Indoor Cabinet
	THN6703A	60" Indoor Cabinet, 2 Rails
	TTN5040A	Grommet Channel Kit
	3083765X04	7.62m (25 ft) Trunk Cable
	3083765X05	15.24m (50 ft) Trunk Cable
Miscellaneous	3083765X06	22.86m (75 ft) Trunk Cable
	3083765X07	30.48m (100 ft) Trunk Cable
	HSN1000	External Speaker
	0185180U01	External Speaker Cable
	GMN6147	Service Microphone

FOREWORD

Product Maintenance Philosophy

Due to the high percentage of surface-mount components and multi-layer circuit boards, the maintenance philosophy for this product is one of Field Replaceable Unit (FRU) substitution. The station is comprised of self-contained modules (FRUs) which, when determined to be faulty, may be quickly and easily replaced with a known good module to bring the equipment back to normal operation. The faulty module must then be shipped to the Motorola System Support Center for further troubleshooting and repair to the component level.

The System Support Center can be contacted at:

Address	Phone No.	FAX No.
Motorola Systems Support Center 1311 East Algonquin Rd. Schaumburg IL, 60196, USA	(800) 925-0911	(847) 576-2172

For other issues call:

(800) 448-3245

or

(847) 576-7300

Scope of Manual

This manual is intended for use by experienced technicians familiar with similar types of equipment. In keeping with the maintenance philosophy of Field Replaceable Units (FRU), this manual contains functional information sufficient to give service personnel an operational understanding of all FRU modules, allowing faulty FRU modules to be identified and replaced with known good FRU replacements.

The information in this manual is current as of the printing date. Changes which occur after the printing date are incorporated by Instruction Manual Revisions (SMR). These SMRs are added to the manuals as the engineering changes are incorporated into the equipment.

Documentation Conventions

Documentation conventions are used in this manual to highlight certain information.

The area to the left of the text column contains key words and graphic symbols which allow the reader to quickly identify desired information.

The following text highlight symbols are used:



A note symbol indicates important information that helps improve the described function.



CAUTION

A caution symbol indicates a potential problem, unless the proper actions are taken. A caution also explains how to avoid the problem.



WARNING

A WARNING symbol indicates the potential for personal injury or serious system degradation unless the proper actions are taken. A WARNING also explains how to avoid the problem.



IMPORTANT

An IMPORTANT symbol indicates the potential for damaging the station unless the proper actions are taken. An IMPORTANT note also explains how to avoid the problem.



This graphic symbol appears in this manual and on the station front panel (and other station surfaces) as a reminder that the station can become extremely hot during normal station operation. Turn off all power to the station, and wait until sufficiently cool before touching the station.

Service and Replacement Modules

For complete information on ordering FRU replacement modules, or instructions on how to return faulty modules for repair, contact the appropriate facility:

	Address	Phone No.	FAX No.																																				
United States	Motorola Inc. Radio Products Services Division 2200 Galvin Dr. Elgin, IL, 60123, USA	(800) 422-4210	(800) 622-6210																																				
Canada																																							
International		(847) 538-8023	(847) 576-3023																																				
Mexico	Motorola de Mexico Huatabampo No. 50 APDO Postal 71064 Mexico DF 06700	(525) 584-4560	(525) 584-6843																																				
Asia	Motorola Singapore Parts Centre 1302 Lor 1 Toa Payoh Siong Hoe Ind Bldg. #01-03/04 Singapore 1231	(65) 353-0311	(65) 353-9152																																				
Australia & New Zealand	Motorola Australia Ltd. 666 Wellington Rd. Victoria 3170 Melbourne Australia	(61) 3 566-7766	(61) 3 566-7910																																				
Japan	Nippon Motorola Ltd. 3-20-1 Ninomi Azabu Minato-Ku Tokyo 106 Japan	(81) 3 3440 3311	(81) 3 3440 3505																																				
Europe, Mideast & Africa	Motorola GmBH Heinrich - Hertz Strasse 1 D-65232 Taunusstein 4 Germany	0049-6128-702164	0049-6128-704903																																				
OR Local phone numbers are available for the following European countries: <table> <tr> <td>Austria:</td><td>06 60 75 41</td><td>Italy:</td><td>16 78 77 387</td></tr> <tr> <td>Belgium:</td><td>08 00 72 471</td><td>Luxemburg:</td><td>08 00 23 27</td></tr> <tr> <td>Denmark:</td><td>80 01 55 72</td><td>Netherlands:</td><td>60 22 45 13</td></tr> <tr> <td>Finnland:</td><td>08 00 11 49 10</td><td>Norway:</td><td>80 01 11 15</td></tr> <tr> <td>France:</td><td>08 00 90 30 90</td><td>Portugal:</td><td>05 05 49 35 70</td></tr> <tr> <td>Germany:</td><td>01 30 18 75 24</td><td>Spain:</td><td>90 09 84 902</td></tr> <tr> <td>Greece:</td><td>00 80 04 91 29 020</td><td>Sweden:</td><td>02 07 94 307</td></tr> <tr> <td>UK:</td><td>08 00 96 90 95</td><td>Switzerland:</td><td>08 00 55 30 82</td></tr> <tr> <td>Ireland:</td><td>18 00 55 50 21</td><td>Iceland:</td><td>80 08 147</td></tr> </table>				Austria:	06 60 75 41	Italy:	16 78 77 387	Belgium:	08 00 72 471	Luxemburg:	08 00 23 27	Denmark:	80 01 55 72	Netherlands:	60 22 45 13	Finnland:	08 00 11 49 10	Norway:	80 01 11 15	France:	08 00 90 30 90	Portugal:	05 05 49 35 70	Germany:	01 30 18 75 24	Spain:	90 09 84 902	Greece:	00 80 04 91 29 020	Sweden:	02 07 94 307	UK:	08 00 96 90 95	Switzerland:	08 00 55 30 82	Ireland:	18 00 55 50 21	Iceland:	80 08 147
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Station FRU Components

The following Field Replacement Units (FRUs) can be ordered for an MTR2000 350MHz station:

Module Description	FRU Kit #
Receiver Module (335 to 405 MHz)	CLD1020
Exciter Module (335 to 405 MHz)	CLD1030
Power Amplifier (40 W, 335 to 405 MHz)	CLD1010
Station Control Module	CLN1465
Station Backplane Board	CLN1202
Power Supply (250 W), AC with DC Battery Connect	CLN1221
Power Supply (250 W), DC-Only	CLN1223
4-Wire, Wireline Interface Board	CLN1203
4-Wire, Euro Wireline Interface Board	CLN1204
8-Wire, Wireline Interface Board	CLN1205
Auxiliary I/O Board	CLN1206

Need help to identify a part number?

If help is required to identify a part number, call:

(847) 538-0021

GENERAL SAFETY INFORMATION

The United States Department of Labor, through the provisions of the Occupational Safety and Health Act of 1970 (OSHA), has established an electromagnetic energy safety standard which applies to the use of this equipment. Proper use of this radio will result in exposure below the OSHA limit. The following precautions are recommended:

- DO NOT operate the transmitter of a mobile radio when someone outside the vehicle is within two feet (0.6 meter) of the antenna.
- DO NOT operate the transmitter of a fixed radio (base station, microwave and rural telephone RF equipment) or marine radio when someone is within two feet (0.6 meter) of the antenna.
- DO NOT operate the transmitter of any radio unless all RF connectors are secure and any open connectors are properly terminated.

In addition:

- DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- All equipment must be properly grounded according to Motorola installation instructions for safe operation.
- All equipment should be serviced only by a qualified technician.
- An operating license may be required to operate this station.

Refer to the appropriate section of the product service manual for additional pertinent safety information.



Some station components can become extremely hot during station operation. Turn off all power to the station, and wait until sufficiently cool before touching the station.

PERFORMANCE SPECIFICATIONS

General

Frequency Range:	335 to 405 MHz			
Number of Channels:	32			
Frequency Generation:	Synthesized			
Power Supply Type:	Switching			
Power Supply Input Voltage:	85 to 264 Vac			
Power Supply Input Frequency:	47 to 63Hz			
Current Consumption (typical):		<u>14 Vdc</u>	<u>120 Vac</u>	<u>240 Vac</u>
	Standby	1.5 A	0.5 A	0.3 A
	Transmit	9.0 A	2.4 A	1.3 A
	Note: Current consumption values during transmit are at full rated output.			
Temperature Range (ambient):	−30°C (−22°F) to +60°C (+140°F), measured at station			
Dimensions:	48.3 cm (19") x 41.3 cm (16.5") x 13.4 cm (5.25")			
Approximate Weight:	19 kg. (40 lbs.)			
Environmental Spec.	I.P. 20			

Transmitter

Power Output:	2 to 40 W
Electronic Bandwidth ≤ 40 W:	335 to 405 MHz
Intermodulation:	40 dB (40 W)
Spurious and Harmonic Emissions:	–85 dBc
Deviation:	±5 kHz (30 kHz) ±5 kHz (25 kHz) ±4 kHz (20 kHz) ±2.5 kHz (12.5 kHz)
Audio Sensitivity:	–20 dBm to 0 dBm (variable)
Audio Response:	+1, –3 dB from 6 dB per octave pre-emphasis; 300 to 3000 Hz referenced to 1000 Hz at line input
Audio Distortion:	<3% @ 1000 Hz; 60 % RSD
FM Hum and Noise:	50 dB nominal (30 kHz) 45 dB nominal (25 kHz) 45 dB nominal (12.5 kHz)
Frequency Stability:	1.0 ppm

PERFORMANCE SPECIFICATIONS (Cont'd)

Receiver

Electronic Bandwidth with High Performance Preselector:	335 to 405 MHz
Channel Spacing:	12.5 kHz, 20 kHz, 25 kHz, 30 kHz
Sensitivity (12 dB SINAD)	0.35 μ V
Selectivity:	80 dB (25 kHz) 75 dB (12.5 kHz)
Intermodulation:	82 dB (25 kHz) 79 dB (12.5 kHz)
Spurious and Image Rejection:	85 dB nominal
Off Channel Acceptance:	2 kHz
FM Hum and Noise:	50 dB nominal (25/30 kHz) 45 dB nominal (12.5 kHz)
Wireline Output:	-20 dBm to 7 dBm @100 % RSD 1 kHz
Audio Response (@ Wireline output):	+1, -3 dB from 6 dB per octave de-emphasis; 300 to 3000 Hz referenced to 1000 Hz output
Audio Distortion:	<3 % @ 1000 Hz; 60 % RSD
Frequency Stability:	1.0 ppm

Specifications per TIA/EIA603 method of measurement.

Due to Motorola's commitment to quality, all specifications subject to change without notice.

GLOSSARY OF TERMS AND ACRONYMS

A

AGC	Automatic Gain Control
Alert tone	Audio signal produced by the station, providing feedback to the user.
ASIC	Application Specific Integrated Circuit
AUX	Auxiliary.

C

CCI	Control Channel Indicate
CDCSS	Continuous Digital-Controlled Squelch Systems (DPL)
CTCSS	Continuous Tone-Controlled Squelch Systems (PL)
CIT	Central Interconnect Terminal. Used to provide telephone interconnect capability in a trunked station.
CIU	Console Interface Unit. Interface between operator console and station to provide encryption/decryption functions.
Clear	Channel modulation type in which voice information is transmitted over the channel using analog modulation.
Code detect	Traditional term used to indicate that a 12kbps CVSD signal is being received on the RF channel.
Conventional	Term used for standard non-trunked radio system (usually using TRC/DC console).
CPI	Console Priority Interface - option allowing console control of a trunked station.

D

DDM	Dual Device Module
DPL	Digital Private Line (See PL)
DSP	Digital Signal Processor, microprocessor specifically designed to perform digital signal processing algorithms.
DVP	Digital Voice Protection, or Digital Voice Privacy, applies to the Vulcan encryption algorithm and the Motorola product in which it is sold.

E

EIA	Electronic Industries Association
E/M	Telephone circuit signalling lines (Ear/Mouth, Ernie/Mary)
EOM	End-Of-Message, 6 kHz signal transmitted at the end of a 12 kbps CVSD signal that is used by the receiving unit for fast muting of the speaker audio for squelch tail elimination.
ESD	Electro Static Discharge
ETS	European Telecommunications Standards

F to H

Failsoft	Trunked station mode entered when central controller fails.
FFSK	Fast FSK
FM	Frequency Modulation
FRU	Field Replaceable Unit.
FSK	Frequency Shift Keying
GPI	General Purpose Input.
GPO	General Purpose Output.
HLGT	High Level Guard Tone

I to L

IC	Integrated Circuit
i-f	intermediate frequency
I/O	Input or Output
IRB	Inbound Recovery Board used with the Trunking Controller
IRQ	Interrupt Request.
ISW	Inbound Signalling Word, data packet transmitted on the inbound Trunking control channel by the subscriber unit when requesting channel allocation.
LLGT	Low Level Guard Tone

M to O

MAN_CS	Manual Channel Select.
MDC	Motorola Data Communications. 1200 or 4800 baud data signalling scheme.
MISO	Master In, Slave Out.
MON	Monitor.
MOSI	Master Out, Slave In.
MRTI	Microprocessor Radio-Telephone Interconnect; a Motorola system that provides a repeater connection to the telephone network (The MRTI allows the radio to access the telephone network when the proper access code is received).
MSK	Minimum Shift Keying
OSW	Outbound Signalling Word, data packet transmitted on the outbound Trunking control channel by the central controller that contains call assignment information for the subscriber.

P

PA	Power Amplifier that transmits final RF signal to transmit antenna
PL	Private-Line tone squelch; a continuous subaudible tone that is transmitted along with the carrier (A radio that has PL on the receive frequency will require both the presence of carrier and the correct PL tone before it will unmute). Also, if there is PL on the transmit frequency, all transmissions by the radio will be modulated with the PL tone. Modulation will be continuous.
PLL	Phase locked loop; a circuit in which an oscillator is kept in phase with a reference, usually after passing through a frequency divider.
PSTN	Public Switched Telephone Network
PTT	Push-to-talk; the switch located on the left side of the radio which, when pressed causes the radio to transmit.

R

RA/RT	Remote Access/Remote Transmit
RAC	Repeater Access Control
RdStat	Receiver Data Status
Repeater	Remote transmit/receive facility that retransmits received signals in order to improve communications range and coverage.
RF	Radio Frequency
RSS	Radio Service Software; the software application used to program and service the station.
RSSI	Received Signal Strength Indicator; a dc voltage proportional to the received RF signal strength.

S

SCM	Station Control Module; station controller.
SINAD	Acronym for the ratio of signal plus noise plus distortion and noise plus distortion.
SMR	Schaumburg Manual Revision
Smart Repeater	Trunking system in which channel control is distributed among several repeaters.
Spectra-TAC	Analog Total Area Coverage voting comparator used to select wide area receivers.
SPI	Serial Peripheral Interface (clock and data lines); simple synchronous serial interface for data transfer between processors and peripheral ICs.
Squelch	Automatic receiver quieting accomplished by muting audio circuits when received signal levels fall below a pre-determined value.
SRAM	Static RAM, memory chip used for scratchpad memory.

T

TCC	Trunking Central Controller; main control unit of the trunked dispatch system; handles ISW and OSW messages to and from radios in the field (See ISW and OSW).
TOC	Turn Off Code; alternating binary pattern used by DPL signalling to provide fast muting of the receiving radio.
TRC	Tone Remote Control
Trunking	Radio control system which permits efficient frequency utilization and enhanced control features.
Type II Trunking	Motorola trunking system which provides extended features.

U, V

VCO	Voltage-Controlled Oscillator; an oscillator whereby the frequency of oscillation can be varied by changing a control voltage.
VOX	Voice Operated Switch; Used with MRTI.
VSWR	Voltage Standing Wave Ratio.

W to Z

WCI	Wildcard Input
WCO	Wildcard Output
WFI	Word Frame Interrupt; used to synchronize trunking data messages in a Smart Repeater system.
Wide Area	Wide area systems allow expanded radio coverage by using multiple receivers and/or transmitters.
WL	Wireline
WL Rx	Wireline Receive; information from station rf receiver sent to wireline equipment.
WL Tx	Wireline Transmit; information from wireline equipment sent to station rf transmitter.